

# Unfors Solo DENT

– X-ray meter for dental applications



- ✓ Tailor made for dental X-ray
- ✓ Leading precision and ease-of-use
- ✓ Active Compensation of dose and kVp

**unfors** 

# Unfors Solo DENT

– Leading precision designed for dental X-ray measurements

*The Unfors Solo DENT is a meter for quality assurance and service of dental X-ray machines. This fast and easy-to-use meter provides leading precision and tailor made measurement capabilities for all dental applications.*

The Unfors Solo DENT simultaneously measures the parameters kVp, dose, dose rate, pulses and time. Options such as direct HVL measurements and waveform display, further enhance the Unfors Solo experience. In addition, with its minimal setup time, acquiring your first exposure take less than one minute.



## Developed to improve your productivity

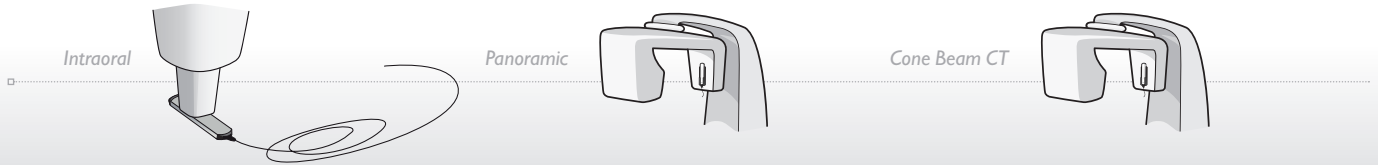
Unfors Solo DENT is built on Unfors proven solid state sensor and low power technology resulting in a small and yet high performing dental measurement instrument. The Unfors Solo DENT provides best in class productivity to its users by:

- the utilization of one detector to capture all X-ray parameters
- the capturing of all parameters in one exposure
- the utilization of Active Compensation
- the Intuitive user interface

Active Compensation means that the multiple solid state sensors and advanced calculations automatically determine the beam quality, thereby eliminating the need for further corrections of measured kVp and dose values. This results in a higher degree of simplicity for the user, requiring no further corrections to achieve maximum accuracy.

# Tailor made for dental measurements

The Unfors Solo DENT provides you with high precision measurements of all the essential X-ray parameters on the dental applications; Cone Beam CT, Panoramic and Intraoral X-ray. Unfors Solo DENT is designed to improve your productivity by its intuitive user interface, built-in intelligence, and minimal set-up time.



## Options for Unfors Solo

In addition to the standard parameters it is possible to add more functionality to the Unfors Solo. This can be done at time of purchase or in conjunction with an annual calibration.

# HVL

### One shot HVL measurements

The Unfors Solo DENT offers the great time saving feature to measure Half Value Layer (HVL) in one exposure. There is no longer a need to add filters and perform calculations. With the HVL option installed in the Unfors Solo DENT, HVL will be measured simultaneously with the other parameters.



### Unfors Solo PC kit

By adding the optional Unfors Solo PC kit, your Unfors Solo DENT will be enhanced with a PC communication for viewing and storage of data and the ability to view waveforms. This option includes Unfors Xi View, a stand-alone program, which displays and stores all exposure data including kV and radiation waveforms as measured by the Unfors Solo DENT. The software can also be used to control the Unfors Solo remotely from a PC. Data can be directly transferred into Excel™ by selecting a book and sheet in a template for further reporting.

# Service Satisfaction Delivered

### Unfors Service Program

The Unfors Service Program expands your capability to minimize the life cycle cost and keeps your instrument in a perfect functional condition year after year. After each annual calibration and service, Unfors provides an extended 12 months functional warranty, extendable for up to 5 years.

# Specifications

## Unfors Solo General

<b>EMC tested</b>	According to EN 61000-6-1:2001 and EN 61000-6-3:2001
<b>Exposure needed</b>	One
<b>Reset</b>	Automatic
<b>Temp. range</b>	15–35 °C (59–95 °F)
<b>Detector cable length</b>	2 and 10 m (6.5 and 33 ft)
<b>Patent</b>	Germany DE69430268.6-08, UK 0758522, Japan 3449721, Sweden 9302909-8, France 075822, USA 5761270
<b>Size Base Unit</b>	28 x 74 x 142 mm (1.1 x 2.9 x 5.6 in)
<b>Weight</b>	250 g (9 oz)
<b>Power off</b>	Automatic after 5, 20 or 60 min of inactivity
<b>Power source</b>	Rechargeable NiMH standard 9 V
<b>Battery time</b>	10–20 hours (depending on detector and if Bluetooth is used)
<b>Read out</b>	Three row alphanumeric backlit display with four digits numerical resolution

## Unfors Solo DENT

<b>Size Detector</b>	12 x 22 x 117 mm (0.5 x 0.9 x 4.6 in)
<b>Weight</b>	50 g (2 oz)
<b>Dose (DENT low)</b>	
<b>Range</b>	10 nGy–9999 Gy (1 µR–9999 R)
<b>Trig level</b>	1 µGy/s (7 mR/min)
<b>Uncertainty</b>	5 % or ± 10 nGy (1 µR) (40–150 kVp, HVL: 1.5–14 mm Al <sup>(1)</sup> , Active Compensation)
<b>Dose (DENT high)</b>	
<b>Range</b>	10 µGy–9999 Gy (1 mR–9999 R)
<b>Trig level</b>	100 µGy/s (0.7 R/min)

<b>Uncertainty</b>	5 % or ± 10 µGy (1 mR) (40–150 kVp, HVL: 1.5–14 mm Al <sup>(1)</sup> , Active Compensation)
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### Dose rate (DENT low)

<b>Range</b>	10 nGy/s–1 mGy/s (70 µR/min–7 R/min)
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<b>Min. peak trig level</b>	1 µGy/s (7 mR/min)
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<b>Uncertainty</b>	5 % or ± 10 nGy/s (70 µR/min) (40–150 kVp, HVL: 1.5–14 mm Al <sup>(1)</sup> , Active Compensation)
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### Dose rate (DENT high)

<b>Range</b>	20 µGy/s–1000 mGy/s <sup>(2)</sup> (140 mR/min–7000 R/min)
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<b>Min. peak trig level</b>	100 µGy/s (0.7 R/min)
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<b>Uncertainty</b>	5 % or ± 10 µGy/s (70 mR/min) (40–150 kVp, HVL: 1.5–14 mm Al <sup>(1)</sup> , Active Compensation)
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### kV/kVp

<b>Range</b>	45–150 kV/kVp
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<b>Uncertainty</b>	2 % (for total filtrations from 2.5 mm Al up to 1 mm Cu or equivalent, Active Compensation)
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<b>Sensitivity (DENT low)</b>	0.4 mA, 40 kV, 40 cm (15.7 in), no added filtration
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<b>Sensitivity (DENT high)</b>	0.8 mA, 70 kV, 50 cm (19.7 in), no added filtration
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### Exposure time

<b>Range</b>	1 ms–999 s
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<b>Uncertainty</b>	0.5 % or 0.2 ms
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### Pulse

<b>Range</b>	1–9999 pulses
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<b>Peak trig level (DENT low)</b>	> 3 µGy/s
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<b>Peak trig level (DENT high)</b>	> 1 mGy/s
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(1) 45 mm Al added filtration at 145 kVp gives a HVL of ~13 mm Al.

(2) 1000 mGy/s up to 70 kVp, 400 mGy/s at 100 kVp, 250 mGy/s at 140 kVp.

## Unfors Solo PC kit

<b>System requirements</b>	Windows 98 (Second Edition, OSR2), Windows 2000, Windows XP, Windows Vista
<b>File format</b>	XML
<b>Communication</b>	RS-232 (115200/8-N-1) or Bluetooth
<b>Bluetooth option</b>	
<b>Connector</b>	9-pin D-SUB, pre-configured for communication with Unfors Xi View
<b>Operating distance</b>	100 m nominal (actual performance depends on environment and receiving Bluetooth module)
<b>Waveform</b>	
<b>Bandwidth DENT low</b>	0.1 kHz
<b>Bandwidth DENT high</b>	2.5 kHz
<b>Memory depth</b>	1 200 ms

## Unfors Solo HVL option

<b>Range</b>	1.0– 14.0 mm Al
<b>Uncertainty</b>	10 % or $\pm 0.2$ mm Al (at signal levels above 1/1000 of max dose rate for selected sensor)

### Unfors uncertainty definition

The expanded uncertainty is stated as the combined uncertainty of measurement multiplied by the coverage factor  $k=2$ , which assuming a normal distribution has a coverage probability of 95 % (complies with GUM by ISO (1995, ISBN 92-67-10188-9).

*All specifications may change without notice.*



*The Unfors Solo DENT comes in a durable aluminum case and it is delivered with a sensor holder for measurements on Panoramic and Cone Beam CT machines.*

## Unfors Instruments

*Unfors is market leading in measuring the radiation from X-ray equipment. Through the development, manufacturing, marketing and servicing of measuring systems for X-ray radiation Unfors contributes to increased knowledge of dangerous radiation. Headquarters are in Billdal, Sweden, where Unfors was founded in 1994. Unfors serves a global market through subsidiaries in the United States, Germany, Singapore, India, Japan and China, and a global sales network.*

### The Unfors Concept



Accurate result   10 s to learn   Pocket sized

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[www.unfors.com](http://www.unfors.com)